Atlantic Richfield Company

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June 18, 2009

Ms. Nadia Hollan Burke Remedial Project Manager U.S. Environmental Protection Agency Region 9 75 Hawthorne Street, SFD-8-2 San Francisco, CA 94105

Subject:

Response to Comments and Extension Request for the Submittal of the Revised Air Quality Monitoring Data Summary Report and Baseline Human Health Risk Assessment Work Plan for the Inhalation Pathway, Yerington Mine Site, Lyon County, Nevada: Administrative Order for Remedial Investigation and Feasibility Study (RI/FS), EPA Docket No. 9-2007-0005

Dear Ms. Hollan Burke:

Atlantic Richfield Company (ARC) respectfully requests that the U.S. Environmental Protection Agency - Region 9 (EPA) extend the deliverable date for updated versions of the Revised Air Quality Monitoring Data Summary Report (AQM DSR) (Revision 2) and Baseline Human Health Risk Assessment Work Plan for the Inhalation Pathway (Inhalation HHRA WP) (Revision 1) for the Yerington Mine Site (Site). EPA provided comments to ARC, including comments from the Yerington Paiute Tribe (YPT) in a letter dated May 21, 2009 for the AQM DSR and Inhalation HHRA WP, both dated January 30, 2009. In the May 21, 2009 letter, EPA requested that ARC: 1) respond to the comments within 30 days (i.e., June 19, 2009), and 2) submit updated versions of the AQM DSR and HHRA within 45 days (i.e., July 2, 2009).

Responses to all comments in the EPA transmittal are attached to this letter. However, prior to the submittal of the revised documents, ARC requests that a technical conference call be held to address two comments on the Inhalation HHRA WP: 1) EPA's request to include off-site deposition of dust in the Inhalation HHRA WP; and 2) the application of the air dispersion model, as ARC would like to clarify the role of the dispersion factors prior to updating the Inhalation HHRA WP. ARC suggests that the deliverable date for the AQM DSR and Inhalation HHRA WP be extended to four (4) weeks after the technical conference call and agreement is reached on the pathways to be included in the Inhalation HHRA WP.

Please contact me at (661) 287-3855 or via e-mail at Roy.Thun@bp.com if you have any questions regarding this extension request.



Ms. Nadia Hollan Burke June 18, 2009 Page 2 of 12

Sincerely,

Roy Thun

Environmental Business Manager

CC: Dave Seter, EPA

Je Batchelle for

Joe Sawyer, NDEP Tom Olsen, BLM James Lucari, ARC Jack Oman, ARC Jim Chatham, ARC

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Lyon County Library

EPA Comments on AQM DSR

EPA General Comment #1 on AQM DSR:

The revised report addresses Tetra Tech's previous comments and the additional information i.e. data tables, figures, inclusion of regional air quality data, etc. provides a good summary of the data and air monitoring program. The report is very thorough and presents the information well.

ARC Response

No response required. ARC appreciates EPA's positive feedback on the report.

EPA Specific comment #1 on AQM DSR:

Tables 6 & 7 are in ng/m^3 rather than the previously requested $\mu g/m^3$. Sulfate is the only chemical reported in $\mu g/m^3$. However, the complete data summary provided in Appendices F and G do provide the data in $\mu g/m^3$. The data should be presented in consistent units throughout the report. Please fix Tables 6 & 7.

ARC Response:

Tables 6 and 7 will be modified so that consistent units are used throughout the report.

EPA Specific Comments #2 on AQM DSR: Page vii 'Dust Events' first bullet paragraph – the statement that dust events "occur over short time intervals (one to several hours)" is incorrect. Residents have reported dust events that lasted for many hours (up to six hours or more), and elevated PM10 measurements have been recorded for similar lengths of time. It appears that this statement is intended to downplay the severity of the dust events, and EPA recommends modification to reflect the instances of longer duration dust events lasting more than several hours.

ARC Response:

The first four bullets under "Dust Events" on Page vii will be revised as follows:

- Residents who live adjacent to the Site reported four 'dust events' in 2005 and seven events in 2006 based on visual observations. The duration of these observed dust events was reported to be up to 6 hours or more. Peak 15-minute wind speeds during these events ranged from 5 to 49 mph. The 24-hour high volume samplers captured five of the 11 observed 'dust events', and 24-hour PM₁₀ concentrations ranged from 4 to 38 μg/m³.
- In 2007, five 'dust events' were recorded based on the continuous PM_{10} monitor data (using an hourly particulate concentration criterion of 300 μ g/m³ at AM-6 to define a 'dust event'). The duration of these recorded 'dust events' typically lasted between two and four hours.
- Based on both visual observation and the numerical criterion, approximately five 'dust events' occured per year at the Site over the three-year monitoring program. The primary mechanism for dust emissions is wind erosion. Numerous 'dust events' occurred during high winds, but periods of high winds did not always result in 'dust events'. This condition indicates that other factors (e.g., lack of precipitation and time of year) beside high wind speeds effect the generation of dust emissions from the Site and background sources, and the potential for a 'dust event'.

EPA Specific Comments #3 on AQM DSR:

Add an Appendix Q, Responsiveness Summary, which includes all EPA comments and ARC responses.

ARC Response

An Appendix Q, Responsiveness Summary, will be added which includes all EPA comments and ARC responses.

EPA Comments on HHRA

EPA General Comments on HHRA Work Plan

General comment #1: Be advised EPA considers the deposition of dust from Anaconda a contributor to offsite soil, indoor dust and attic dust. Identify where in the Human Health Risk Assessment ingestion and dermal pathways for offsite soils, indoor dust and attic dust will be assessed. For a young child the ingestion soil and dust is a common occurrence and evaluating only the inhalation component will underestimate the risk.

ARC Response

Note that this HHRA work plan is not based on a requirement by EPA. ARC voluntarily proposed to conduct an inhalation HHRA in response to community concerns regarding inhalation of airborne dust under short-term or acute and long-term or chronic exposure conditions.

The results of the AQM DSR statistical analysis show that there are no off-site releases of mine-related chemicals in airborne dust with the exception of relatively small increases in the concentrations of aluminum (29 percent) and copper (33 percent) above background concentrations. Background concentration limits for copper vary by over 400 percent ranging from 58 to 285 mg/kg (Background Soils Data Summary Report, Yerington Mine Site, Revision 1, March 9, 2009).

Therefore, the site-related risks for any exposure pathway, including inhalation and off-site deposition of dust, will only be associated with these metals. It is unlikely that either of these metals in air pose a concern to human health. Both metals are considered noncarcinogens with low toxicity. In fact, EPA has not identified an inhalation toxicity factor for copper.

ARC proposes to include off-site deposition of soil, ingestion of indoor, outdoor and attic dust as potentially complete but minor exposure pathways to be addressed qualitatively. The conclusion will be that while this is a completed exposure pathway, the increase in health risk due to site-related chemicals is insignificant due to the small amounts and low toxicity of mine-related releases in dust.

EPA Specific Comment #1 on HHRA Work Plan

Specific comment #1: Page 17, Section 4.4.3 last paragraph, second sentence all chemicals and radiochemicals found at the site are naturally occurring and are present whenever there is dust in the air sourced from other disturbed and undisturbed (i.e. natural) areas in Mason Valley and other upwind locations. This sentence is confusing and appears to be misleading. Chemicals and radiochemicals found at the site are enhanced, chemically altered, and concentrated as a result of mine processing i.e. TENORM. This sentence should be removed or restated to accurately reflect chemical and radiochemical emissions from the site.

ARC Response

Page 17, Section 4.4.3 last paragraph, second sentence will be deleted.

EPA Specific Comments #2 on HHRA Work Plan

Appendix A, page 3, 1st paragraph – Clarify how the 'dispersion factors' will be determined. Will this be a modeled concentration, an estimated value based on the dispersion characteristics or something else? The dispersion factors should be clarified before proceeding with dispersion modeling.

ARC Response

The dispersion factors mentioned in the Air Modeling Objectives and Overview (last sentence in that section on Page 3) will be calculated using the refined AERMOD model (version 07026) as stated in the first paragraph of the following section on Page 3, Selection of Air Model. The following information on Pages 4-10 explains the model parameters based on Source Characteristics and Emissions, Meteorological Data and Receptors, Site Characteristics and AERMET Final Processing.

The following sentence will be added to the introduction to explain how the dispersion factors will be applied:

"The purpose of the Dispersion Modeling Work Plan is to estimate dispersion factors that will be used to extrapolate concentrations measured at the fenceline to estimate concentrations representative of specific receptor locations. These adjusted concentrations will be used in the HHRA to calculate health risks for the off-site receptors associated with inhalation of mine-related chemicals in dust in the air."

Also, the text in the first paragraph under Air Modeling Objectives and Overview will be clarified and refer to the dispersion factors instead of extrapolation ratios.

Note that the second paragraph in this section will be deleted and all chemicals will be treated initially as site-related even though the statistical analysis indicates that only PM10, aluminum and copper concentrations are higher in the downwind samples. Background will be considered in the risk characterization step.

EPA Specific Comment #3 on HHRA Work Plan

Table 3-2: the NAAQS for PM₁₀ is 150 μgm³.

ARC Response

The NAAQS for PM_{10} of 150 μ gm³ will be added to Table 3-2.

Yerington Paiute Tribe Comments on AQM DSR

YPT Comment 1 on AQM DSR

<u>Tables 6—9 of the DSR</u>. The purpose of the last column of Tables 6-9 is not clear. The 95% UCL of the sample <u>mean</u> will <u>always</u> be less than the maximum detected concentration.

Perhaps it was the intent of the work plan to use the 95% upper confidence limit of the data rather than of the mean of the maximum observed concentration, whichever is larger, for the assessment of acute toxicity. Using PM_{10} as an example, the 95% upper confidence limit of the data would be approximately 28 μ g/m³. This would be the concentration that would be expected to be exceeded 18 times a year if sampling were conducted every day.

It would be more conservative to use the larger of the maximum concentration observed or the 99.7% upper confidence limit. This would estimate the PM_{10} concentration that would be expected to occur one day each year if sampling were done every day. For PM_{10} , assuming a normal distribution, the 99.7% upper confidence limit concentration would be approximately 39 μ g/m³.

¹ The upper 95% upper confidence limit of the data is the mean of the data plus 2.78 times the standard deviation of the data (μ + 2.78 x σ). This calculation assumes normal distribution, which is unlikely. Similar calculations may be made for other distributions.

ARC Response 1

The 95% UCL of the sample mean can exceed the maximum concentration. The 95% UCL is a measure of the "true" population while the maximum concentration is based on a subset of the "true" population. The EPA software, ProUCL, developed to calculate upper confidence limits for risk assessment and EPA guidance recommend defaulting to the maximum concentration when the UCL is higher.

EPA Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, 1989, is specific that the 95% UCL, an estimate of the upper bound average concentration, is the appropriate statistic to compare health risk values based on long term exposure.

YPT Comment 2 on AQM DSR

<u>Yerington Paiute Tribe Comments on AQM DSR No. 3.</u> ARC is correct in pointing out that for the June 7, 2007 dust event, the downwind concentrations exceeded upwind concentrations by 90 percent, not by 166 percent as was stated in the comment.

ARC Response 2

No response is required.

YPT Comment 3 on AQM DSR

<u>Yerington Paiute Tribe Comment 5 on CSM Related to AQM</u>. ARC's response to this comment states "...the site sources contribute most of the measured downwind concentrations of arsenic, cobalt, and copper." Section 6.2 of the DSR states that it is PM_{10} , aluminum, and copper that contribute significantly to downwind concentrations.

ARC Response 3

The two statements refer to different types of data as explained in this response.

The sentence from Revision 3 of the CSM, Page 8, second bullet with the words "...the site sources contribute most of the measured downwind concentrations of arsenic, cobalt, and copper." also includes the words 'during short-term peak periods" referring to the dust events. The following sentence in this bullet goes on to explain that, for long-term average periods, the analysis concluded that

emissions of PM_{10} , aluminum and copper concentrations were higher. Section 6.2 of the DSR addresses the 24-hour high volume data and not short-term peak data.

The second bullet under Conclusions and Recommendations in Page ix of the Executive Summary will be revised as follows:

- During the June 5, 2007 'dust event': 1) background and Site emission sources contributed about equally to measured downwind concentrations of PM_{10} , aluminum, cadmium, nickel, and sulfate; and 2) Site emissions contributed most of the measured downwind concentrations of arsenic, cobalt, copper and radiochemicals.
- For long-term average periods, the upwind/downwind evaluation indicates that emissions of PM_{10} , aluminum, and copper migrated off-Site and, on average, contributed to the measured downwind concentrations by approximately 18, 29 and 33 percent, respectively (background sources contribute the remaining amounts). The long-term upwind/downwind evaluation also concludes that other analytes do not migrate off-Site in any appreciable amounts.

Yerington Paiute Tribe Comments on HHRA Work Plan

YPT Comment 1 on HHRA Work Plan

Overall. We suggest that the Health Risk Assessment Work Plan refer to some generally accepted protocol for doing health risk assessments. One such protocol would be the *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, prepared in August 2003 by the Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. The ARC work plan would then only have to document proposed exceptions to that protocol.

ARC Response 1

ARC will add references to the HHRA work plan including, but not necessarily limited to, EPA Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, 1989and the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, prepared in August 2003 by the Office of Environmental Health Hazard Assessment, California Environmental Protection Agency in this list.

YPT Comment 2a on HHRA Work Plan

<u>Section 3.1</u>. ARC has included acute (short-term) and chronic (long-term) human health screening levels in Tables 3-1 through 3-4, but those tables do not include averaging times. Table 5-1, that addresses acute screening levels, includes both averaging times and

references; a similar table for chronic levels should be added to the work plan.

ARC Response 2a

Footnotes will be added to Tables 3-1 to 3-4 to note that chronic levels for the majority of the chronic levels are EPA Regional Screening Levels that are based on 30 years of exposure. Lead values will have foot-notes specific to lead.

YPT Comment 2b on HHRA Work Plan

The tables of acute screening levels should be revised to reflect the national, 24-hour ambient air quality standard for PM_{10} of 150 $\mu g/m^3$, not to be exceeded more than three times in three years. The tables of chronic screening levels should also be revised to include the new, national ambient air quality standard for lead of 0.15 $\mu g/m^3$ as a rolling, three-month average, adopted by EPA on October 15, 2008.

ARC Response 2b

The requested revisions to lead values on the tables will be made.

YPT Comment 3 on HHRA Work Plan

<u>Section 3.1</u>. Section 3.1 states "...only three parameters, PM_{10} , copper, and sulfate, had concentrations with statistically higher concentrations in the downwind samples.." Section 4.4.3 identifies those parameters as PM_{10} , copper, and aluminum.

ARC Response 3

Section 3.1 will be corrected to change sulfate to aluminum.

YPT Comment 4 on HHRA Work Plan

<u>Section 4.2</u>. Section 4.2 cites background concentrations for aluminum and copper as 23,702 and 281 mg/kg, respectively. Are these the concentrations of the elements in background soil? If so, where are those background samples from? What are the EPA Residential Screen Levels having units of mg/kg?

ARC Response 4

Yes, the concentrations are site-specific background for the Site as reported in the Background Soils Data Summary Report, dated March 9, 2009 and approved by EPA. This information and citation will be added to explain the source of the background values in the text.

The EPA residential Regional Screening Levels in soil with units of mg/kg are health risk-based levels for soil considered protective over a lifetime for children and adults. These values replace EPA Region 9 Preliminary Remediation Goals and more information is available at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm.

The purpose of this comparison is to demonstrate that the background concentrations of aluminum and copper are well below concentrations considered safe by EPA for residents and to support the position that minor increases in the soil concentrations of aluminum and copper will not pose a concern to human health.

YPT Comment 5 on HHRA Work Plan

<u>Section 4.4.2</u>. Section 4.4.2 states that the Hazard Quotient is calculated by dividing Daily Intake as calculated according to Section 4.2.3 by the reference concentration (that is, the human toxicity value). Normal practice would be to divide the maximum ambient concentration (expressed as the same averaging time as the toxicity value) by the toxicity value. If ARC intends to use Daily Intake instead of the average, ambient concentration to calculate chronic hazard quotients, a reference documenting that approach should be provided.

ARC Response 5

The approach presented in Section 4.4.2 is correct. As shown in Section 4.2.3, daily intake is an air concentration that is adjusted for exposure frequency, exposure duration and averaging time based on protocols used in the EPA Regional Screening Levels (see web link in the ARC Response to YPT Comment 4). The text will be clarified and the parameter renamed "Daily Intake Concentration".

YPT Comment 6 on HHRA Work Plan

Section 4.4.4. This section states "were deemed sufficiently close to the PRG of 0.00045 μ g/m3. Should this have said detection limit of the arsenic analysis instead of PRG?

ARC Response 6

The statement is correct. For clarification, the following sentence will be added following the phrase in question: "The PRGs are health-based concentrations that are considered protective for a lifetime. The fact that the detection limits are close to the PRG means that any levels of arsenic in the air that may be of concern to human health will be detected."